

## innovations: the manufacturer's view

### Aiming For Accuracy

#### JBL 3 SERIES POWERED STUDIO MONITOR LOUDSPEAKERS

BY PETER CHAIKIN

In August, JBL Professional introduced its 3 Series powered studio monitors, with the goal of delivering a new level of performance and accuracy to the market at price points lower than those of any existing JBL studio monitors.

##### THE DEVELOPMENT PROCESS

At JBL, development is always in process. Since JBL serves virtually all market segments and applications with speakers, when new solutions in the transducer, acoustics and electronics domain come onto the scene in one JBL segment, they may be attractive for additional applications. It wasn't until a number of elements

came into alignment that we had everything needed to start development and set the delivery date for a new line of most affordable studio monitors.

The 3 Series line is targeted to fill the needs of a very broad segment of the market that includes music recording hobbyists, professional video-post and broadcast facilities in need of an affordable reference monitor. From JBL's perspective, "affordable" can't mean "inaccurate." There is a great sense of responsibility that comes with designing a reference monitor. Music producers, post-production customers and broadcasters rely on our speakers to produce program material that sounds good outside the control room. When someone uses any of our monitors, we're



The JBL 3 Series line consists of the LSR305 and LSR308 internally bi-amplified studio monitors with 5-inch and 8-inch low frequency drivers respectively, and 1-inch dome high-frequency drivers.

"packing their parachute" for them. Our philosophy is, and the result of good acoustic design should be, whether you use our top-of-the-line speaker or our low-cost model, you'll

get the same mix. Of course at the higher price points, the monitor delivers greater resolution, higher output and lower distortion, but the bal-

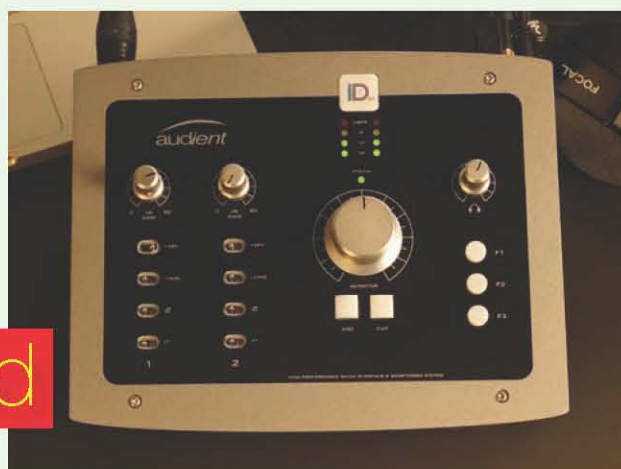
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### Audient iD22 AD/DA Interface & Monitoring System

BY STROTHER BULLINS, EDITOR, PRO AUDIO REVIEW

The iD22 is a Mac OS-compatible, USB-based audio interface and monitoring system featuring a two-input, six-output, 24-bit/96 kHz capable AD/DA with ADAT optical I/O and a number of

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Audient iD22 AD/DA Interface & Monitoring System

attractive features. Those include two superb Audient discrete, Class A preamplifiers with +48 VDC phantom power, -10 dB pad, polarity flip, HPF (-3 dB @ 100 Hz) and two balanced quarter-inch TRS inserts (perfect for those of us with favorite analog outboard). The iD22 (\$995) is housed in thick aluminum—robustly built.

The intuitive Monitor/Mixer application is ideal for building monitor mixes with dual stereo cue mixes (round-trip monitoring, in to out, is 6.33 mS at 44.1 kHz sampling with a 32 sample buffer). Included are assignable talkback, three assignable and customizable function buttons, dim and alternative output controls, and a large, solid-feeling monitor level knob in the middle of an incredibly well-conceived, ergonomically com-

fortable design.

The iD22 is small enough (roughly 7" by 9") to reside discreetly on your desktop. It features retro-influenced HiFi-style knobs, switches and backlit buttons, with a design scheme and overall aesthetics very complimentary to Apple's Mac Book Pro. According to Audient, Windows OS compatibility for the iD22 is on the horizon and iOS compatibility will follow.

The iD22 will serve most self-recordists' interface needs most of the time. This is certainly true for those that build productions one input, or stereo pair, per take. For me—a regular recordist of multiple-input analog sources (drum kit,

multiple room-miked acoustic instrument configurations, etc.)—the iD22 alone wasn't always enough. Wisely, Audient has included ADAT optical I/O, which allows users to expand to a total of 10 analog inputs with full access to iD22's system software routing and mixing capabilities (96 kHz operability will limit outboard analog inputs to a total of six). Audient recommends its (excellent) ASP008 8-channel, variable impedance microphone preamplifier for expansion, though I used a Focusrite Scarlett 18i20 connected via ADAT to the iD22.

I was thrilled to find the two balanced insert points, one per input channel, on the iD22—a unique feature for a small I/O such as this. Like many, I compress while tracking and already own a few analog processors I prefer to use.

The built-in Audient preamps sound superb and crystal clear with high headroom. The GUI is so intuitive that I hardly glanced at the iD22's PDF manual, referencing it only when I had routing questions. The software install was glitch-free too. I've used a variety of USB-based multi-featured I/Os, and the iD22 is currently my favorite. For those wanting a unique edge in this on-the-go, ITB-mixing world, grab an iD22 I/O and hit the ground running.

Audient  
audient.com



## Innovations: JBL

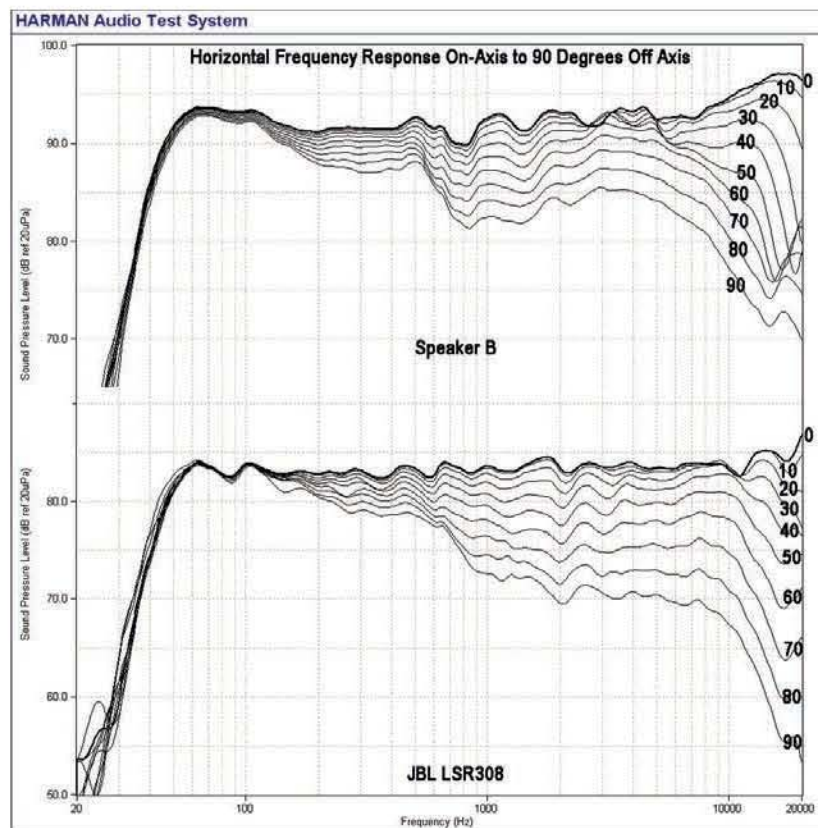
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ances of the mix are the same. A mix created on one model sounds "right" on all the others regardless of price. While developing a flagship reference monitor with jaw-dropping performance pushes the limits of physics and the engineering staff, producing an affordable monitor worthy of professional projects is also tremendously challenging.

### DESIGN OBJECTIVES

The entry-level price segment of the studio monitor market is dense with powered models of varying quality from many manufacturers. We wanted to make a real difference at this price point and we wanted the benefits to be clearly audible. Factoring in manufacturing costs, overhead and margin, the budget for the woofer, tweeter, electronics and

enclosure is very tight. Just getting in the game requires a careful balancing act: Don't slight the budget for the transducers, yet make sure your amps have enough output to achieve reasonable volumes. Fortunately at JBL, our core expertise is in transducer technology and we were able to develop transducers with really good performance at reasonable cost to meet 3 Series cost targets. Using a new class D amplifier solution eliminated the need for a large heat sink, resulting in some cost reduction. While these parts (coupled with a carefully designed crossover) got us in the game, we found the greatest opportunity for audible improvement in the area of directivity and imaging. It is not just the on-axis frequency response, but off-axis component that contributes to a monitor's accuracy and ultimately the speaker's imaging. In this domain, a winning solution hinges on great engineering and acoustic expertise rather than parts cost alone.



This graph shows measurements of one LSR308 Studio Monitor and an identically-priced "speaker B" made at 10 degree increments from a point directly on-axis to a point 90 degrees off axis. The on-axis response of speaker B is not neutral and the off-axis frequency response deteriorates progressively with each measurement. In comparison, JBL describes the LSR308 response as "free of dramatic peaks and dips."

### ENABLING TECHNOLOGIES

In January of 2013, we introduced the M2 Master Reference Monitor, a large flagship studio monitor showcasing JBL's next-generation transducers. The system represents a lot of R&D, recognized with seven patents and two pending. The M2 project was our "space program" out of which new technologies and disciplines emerged that could be leveraged in future projects. The 3 Series models share M2's patent-pending waveguide technology. The distinctive Image Control Waveguide is responsible for the excellent imaging and accuracy customers are responding to in the market.

JBL has long employed waveguide technology to achieve greater accuracy in the room. A properly designed waveguide surrounding the high-frequency transducer controls acoustic energy to (1) match its directivity to that of the woofer at the crossover point, and (2) ensure high-frequency energy is neutral off-axis as well as on-axis. A properly designed waveguide is the product of a complex mathematical formula. Rapid prototyping equipment at JBL allows us to evaluate many iterations of a waveguide design, allowing our engineers to perfect the design and not settle for "good enough." The Image Control Waveguide used in the 3 Series is a very sophisticated piece of engineering. The curvature of the waveguide allows the directivity of the sound in the vertical, horizontal and oblique planes to be uniform. JBL engineer Charles Sprinkle de-

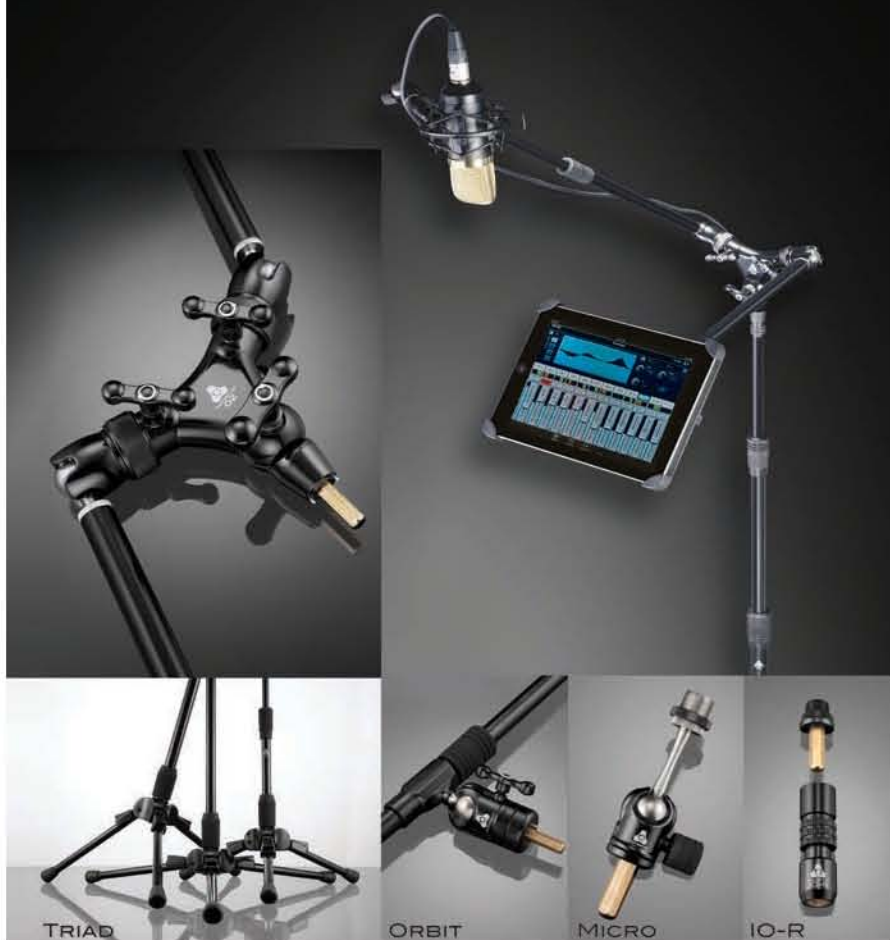
signed the M2 and 3 Series waveguides based on the size and position of the drivers in each monitor and their crossover frequencies. The result is a seamless transition between high and low-frequency drivers and uniform directivity throughout the bandwidth. Small ridges in the throat of the waveguide serve to diffuse very high frequencies. Sound exiting the high-frequency driver clings to the waveguide, hits these ridges, and spreads so subtle high-frequency detail and micro-dynamics are heard at the listening position. An immediately evident benefit of the waveguide is the audible depth and strong phantom center heard in the stereo panorama, caused by optimized summing of energy produced by a stereo pair of speakers. The Image Control Waveguide demonstrates (as confirmed by customers) that when the speaker is telling the same story in every direction, magic happens.

The JBL 3 Series line consists of the LSR305 and LSR308 internally bi-amplified studio monitors with 5-inch and 8-inch low frequency drivers respectively, and 1-inch dome high-frequency drivers. While high-quality parts got us in the game, the positive response to the 3 Series line demonstrates success is contingent the attention we paid to directivity.

Peter Chaikin serves JBL Professional as Senior Manager, Recording and Broadcast Marketing.

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## Fitz &amp; The Tantrums Shake Things Up

BY KELLEIGH WELCH

NEW YORK, NY—Soundchecking hours before taking the stage at the Roseland Ballroom, Michael Fitzpatrick ('Fitz'), lead singer of the indie soul/pop group Fitz and the Tantrums, steps up to his mic, and with his attention focused on the FOH, belts out a long, clear note, rattling the walls of the historic concert hall.

"You're knocking off pieces of the ceiling," laughed Jamie Wellwarth, production manager and FOH engineer for the band, pointing out pieces of debris lazily floating down to the floor.

Hearing those strong vocals blasting through the JBL VerTec system during the initial soundcheck was only a taste of the high-energy concert the band would bring to the stage later that evening. Since the release of the hit single, "MoneyGrabber" in 2010, the band, led by Fitz and Noelle Scaggs, has quickly climbed into mainstream success with energetic dance numbers and exciting live shows—a fact that was proven while the band wrapped up its "Brighter Futures" tour this fall, closing out promotion of its second album, *More Than Just A Dream*.

In late October, Fitz and the Tantrums made a stop in New York City to perform at the historic Roseland Ballroom, a popular, 3,000-seat concert venue on West 52nd Street in midtown Manhattan that has hosted some of music's greatest artists, in-



Fitz & the Tantrums, an indie soul/pop group from Los Angeles, used a number of Shure microphones to capture its high-energy dance numbers every night on its recent tour. (Inset) Engineer Jamie Wellwarth has manned the FOH for Fitz & the Tantrums for the past two years.

cluding The Rolling Stones, Frank Sinatra and Glenn Miller. The venue first opened in 1919, and will close its doors in April, 2014, adding the recent performance by Fitz and the Tantrums to its history.

For Wellwarth, mixing at Roseland was particularly exciting, as he attended many concerts at the venue growing up. "I'm a little biased when it comes to this venue, coming from New York originally," Wellwarth said. "We've played in mainly venues of this size on the tour, but the difference is that this is Roseland."

Wellwarth has worked with the band for the past two years, mixing on an Avid Venue SC48, a console he was happy to have. "We went three days without a soundcheck recently," he said, explaining that the band was traveling back and forth between New York City, Providence, Boston and Hartford as part of the tour and making a few TV appearances along the way. With the Avid Venue SC48, he was able to save his settings from previous shows, plug into the venue's house system and make adjustments

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## briefs

## Thunder Rolls Into Austin

AUSTIN, TX—Thunder Audio ([thunderaudio.com](http://thunderaudio.com)) provided a Harman JBL ([jblpro.com](http://jblpro.com)) VTX line array system with Crown ([crownaudio.com](http://crownaudio.com)) I-Tech HD amplifiers for the Austin City Limits Music Festival for two weekends in October.

## Zac Brown Fest Goes MLA

NASHVILLE, TN—The largest Martin Audio ([martin-audio.com](http://martin-audio.com)) MLA system yet was created for the Zac Brown Band's Southern Ground Music & Food Festival, held in Riverfront Park.

## Paramore Captured By Voodoo

NEW YORK, NY—FOH engineer Eddie Mapp is using three sE Electronics ([seelectronics.com](http://seelectronics.com)) Voodoo VR1 ribbon mics and two IRF2 instrument reflexion filters on the current Paramore arena tour.

## Lincoln Stadium Chooses EV

LINCOLN, NB—The new 15,147-seat Pinnacle Bank Arena in Lincoln, NB sports an Electro-Voice ([electrovoice.com](http://electrovoice.com)) line-array system featuring the compact three-way XLD281 element. Security and access equipment from EV's parent company Bosch was also installed.

## Arsenio Audio Team Gets Busy

LOS ANGELES, CA—Back in the late '80s and early '90s, *The Arsenio Hall Show* was the late-night talk show to watch. Now the daily, one-hour, nationally syndicated show has returned, once again hosted by its namesake. While some of the original show's trademarks, like the infamous dog pound, have returned, too, the audio technology that gets used nightly is very much from the 2010s, replete with multiple consoles, shared resources and networked audio.

As the sound system designer and music mixer for the show, Peter Baird and the production mixer, house and monitor engineers chose five Yamaha CL Digital Audio Consoles and six Rio3224-D input/output boxes for the show. Two CL5s and one CL3 are used at front of house, with two CL5s at the monitor mix position.

"When production mixer Ish Garcia asked me to come in as the show's music mixer, we spent some time together strategizing about what an ideal system would look like," said Baird. "We knew the show would be very music-heavy and wanted the system requirements to check four main boxes: 160 inputs available to split between the house band, guest artists, and production; tight integration and future-proofing; stability and reasonable immunity from buzzes, hums, and grounding issues; and incontestably great sound." The system would find separate console operators using shared resources and likely a large Dante network as well.

Baird added that the economics of networked audio are not insignificant. "Traditionally a show like *The Arsenio Hall Show* would have

at least three 56 pair of three-way transformer splitters with all of the associated interconnect copper between them, and in some cases, hundreds and hundreds of feet. Those 504 outputs (3 x 56 x 3) would feed separate consoles, with each output requiring a separate head amp. As mixers, we know that the best-sounding consoles are the ones with the best head amps, and a console with 64 top-drawer head amps costs more money than one with 64 mediocre head amps. But a networked system only needs one really great head amp per channel no matter how many consoles it's connected to; with the CL series



Outside the mix booth on *The Arsenio Hall Show* are (l-r): Greg Kestlake, Peter Baird and James Young.

having only 8 head amps on board, Yamaha was able to spend time and money making the console as ergonomically correct as possible rather than trying to re-engineer head amp design to fit a small footprint. Also, in the case of Dante, local interconnects are on Cat 6 cable, with point-to-point connections on fiber,

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## Gift Guide

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phones is designed for drummers or for mixing applications, whether in the studio or at the monitor desk at stageside. [beyerdynamic.com](http://beyerdynamic.com)

• **Behringer CT100 Cable Tester:** A great way to help any live sound engineer is to provide him or her with a device to test cables. Behringer's CT100 offers just that—a phantom-powered, microprocessor-controlled cable tester with all standard connectors. [behringer.com](http://behringer.com)

• **JBL Pulse:** For friends who went to every EDM festival last summer (or who mixed a few), here's a wireless, Bluetooth speaker that'll let them relive the experience. Slightly bigger than a soda can, the cylindrical JBL Pulse comes with built-in, pre-programmed LED lights that play with your music. [jbl.com](http://jbl.com)

• **FeltAudio Pulse:** Like the idea of a Bluetooth speaker but need something less flashy and more portable? The 2.3-ounce, rechargeable Pulse resembles a *Star Trek* Communicator and kind of acts like one, too: While it'll play your music, it also has a built-in mic, allowing hands-free calling up to 30 feet from a smartphone, and its clever clip/stand attaches it to straps and clothing. FeltAudio also makes a line of Android and iPhone cases that allow the Pulse to snap onto the back of the phones. [feltaudio.com](http://feltaudio.com)

• **Origaudio Rock-It 3.0:** Stick this pod-like device on to any object

and turn it into a speaker. Featured on ABC's *Shark Tank*, the Rock-It turns music from your iPod into vibrations, and once stuck to an object, will play music through it via conduction. It's portable and runs off of rechargeable batteries, so you can bring the music with you wherever you go. Prefer headphones? Try their line inspired by vegetables, called "Beets." [origaudio.com](http://origaudio.com)

• **Tune In—The Beatles: All These Years, Vol. 1:** A decade in the making, the first edition of Mark Lewisohn's epic biography is now available. The series chronicles everything that surrounds music's most famous band, The Beatles, starting from before the childhoods of John Lennon, Paul McCartney, George Harrison and Ringo Starr. This 946 page book will keep any engineer busy during downtime. [thebeatlesbiography.com](http://thebeatlesbiography.com)

• **Box Sets:** A few notable box sets that are out for the holidays include: *Bob Dylan: The Complete Album Collection, Vol. 1*; *The Who's Tommy: Super Deluxe Box Set*; *The Beatles Live at the BBC—The Collection*; and the Amnesty International *The Human Rights Concerts* package, featuring live performances by The Police, U2, Peter Gabriel, Joan Baez and Radiohead.

• **Music Documentaries:** Music documentaries made a huge comeback this year, with the theatrical and DVD releases of Dave Grohl's paean to his Neve console, *Sound City*; a historical overview of the soulful Sixties sound of Alabama with *Muscle Shoals*; and a tribute to the king of adult contemporary, *The Greatest Bars In Town: The Arif Mardin Story* (see

our review on page 18).

• **Gakken Premium DIY Gramophone Kit:** OK, so this isn't exactly something you'd take on tour, but for the engineer who loves to listen to that analog sound, this is a great gift. Developed in Japan, this kit provides you with everything you need to build your own functional gramophone. This device is powered by a wound spring, so no electricity is needed, and it can play or record to vinyl records. [thinkgeek.com](http://thinkgeek.com)

• **Mixtape Glasses or Musical Wine Glasses:** Uncommongoods.com is an awesome site to find unique gifts for all interests. For example, this set of six Mixtape glasses are great for any party and are a great addition to any music fan's home. If you want to get a classier gift, there's also the Major Scale Musical Wine Glasses, which are decorated with markings so when you fill the drink up to the line, you can actually play that note by running your finger along the top.

• **Metallica Ugly Christmas Sweater:** The Ugly Christmas Sweater never goes out of style (because it's never been in style), so why not go beyond the basic light-up Christmas tree and buy Metallica's own version of this classic holiday attire? [cheezburger.com](http://cheezburger.com)

• **The 12 Days of Sound:** If you still need ideas after all this—and even if you don't—visit [prosound-newtork.com/12days](http://prosound-newtork.com/12days) to discover The 12 Days of Sound, a special rundown of even more gift-giving ideas for the audio pros in your life.



## Fitz

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on the fly during the show if the band doesn't have time for a soundcheck.

The Avid console also helped Wellwarth deal with his biggest challenge—adjusting to each venue and the provided PA system. "Working at different venues with different PAs is always a challenge. What I really want is to be able to step up to the next level and start carrying our own PA," Wellwarth said. "My main goal is clarity, and really playing the whole frequency range. I even have an analog Avalon 747 in my rack. In the digital world, sometimes the sound is harsh, so I want to try and warm it up with that."

For the tour, Clair provided the majority of the band's gear, including the Avid SC48, a collection of Shure mics, a Soundcraft Vi1 console for monitors, and Shure PSM 900 and PSM 1000 in ear monitors. To



Aaron Glas, monitor engineer for Fitz & the Tantrums used a Harman Soundcraft Vi1, throughout the band's recent tour, including this stop in Las Vegas.

capture Fitz's vocals, Wellwarth used a Telefunken M81, while Scaggs was heard via a Shure KSM9. Edgewood, NY-based RSA Audio Service, long the main audio provider for Roseland, provided the evening's sizable

JBL VerTec VT4888 line arrays with Crown amplifiers.

Wellwarth recalled that when the band started, it was only using wedges for monitors, but because of the high energy in its performances, the stage was too loud. Once monitor engineer Aaron Glas came onboard, Wellwarth was able to convince the band to switch to in-ears.

For this particular tour, Wellwarth said they faced a number of obstacles off stage, including blowing two tires the morning of their New York City show. Even with the minor setbacks, Wellwarth said the key is to stay positive: "Even in the hardest times, that is the goal for everyone on tour. I'm always reminding myself that I'm doing exactly what I've always wanted to do. But ultimately, the goal is to have the audience enjoy the show."

And it did.

Shure  
[Shure.com](http://Shure.com)

Avid  
[Avid.com](http://Avid.com)

## Arsenio Hall

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a monumental savings over the same capabilities in copper. And to clarify, the head amps in the Rio3224-D input/output box are spectacular—they are clear and detailed, yet with great body, warmth, and musicality."

Monitor Engineer, Greg Keslake noted, "We are using Dante exclusively for FOH, Monitors and Music Production, and I am even using a Dante MY16 Card in my house monitor console for high level returns from production." Keslake said for monitors he's using one CL5 dedicated to the house band and one dedicated to the guest bands: "The house band is using the new Aviom 360s, and I am sending the band each a mixture of direct outs, mixes and matrices. This has given them the comfort of being able to adjust the instruments of their choice very quickly but hasn't limited my ability to supplement their mixes as needed. The Yamaha CL has also made it extremely easy to swap around what channels I send the house band, based on weekly sit-in artists, via Dante patching."

On the guest band console, Keslake has dedicated mixes 1-16 as stereo in-ears, 17-24 as wedges, matrixes 1-7 are effects sends, and matrix 8 is a drum sub mix. "The dedicated mixes have allowed me to have a very good starting point for almost any guest band with very little information. I have found the ability to map my own channels to custom fader banks immensely valuable, specifically on the CL5 guest band console. I am using the C5 and C6 banks to map my daily-used mixes, enabling me to bounce around very quickly between them. I was also extremely impressed with the addition of the Premium Rack in the CL Series."

With an audience of 201, James Young, front of house engineer is using a CL3 for the house band with six stems to the CL5 production console: left, right, sub, two vocal stems, lead and BGV, and a 'guest' stem for when someone sits in with the house band. Guest bands land in a separate CL5 with a similar six-stem setup.  
Yamaha Commercial Audio Systems, Inc.  
[yamahaca.com](http://yamahaca.com)